

The Commento
"To Comment or Not to Comment"

From Code Complete, 2nd Edition by Steve McConnell

The Commento - Steve McConnell

INT. MEETING ROOM - MORNING

NARRATOR (V.O.)

Comments are easier to write poorly than well, and commenting can be more damaging than helpful. The heated discussions over the virtues of commenting often sound like philosophical debates over moral virtues, which makes me think that if SOCRATES had been a computer programmer, he and his students might have had the following discussion.

SOCRATES (a wise old programmer), THRASYMACHUS (a green, theoretical purist who believes everything he reads), CALLICLES (a battle-hardened veteran from the old school - a "real" programmer), GLAUCON (a young, confident, hot-shot computer jock), and ISMENE (a senior programmer tired of big promises, just looking for a few practices that work) are standing in a circle having just ended their daily standup meeting.

SOCRATES

Does anyone have any other issues before we get back to work?

THRASYMACHUS

I want to suggest a commenting standard for our projects. Some of our programmers barely comment their code, and everyone knows that code without comments is unreadable.

CALLICLES

You must be fresher out of college than I thought. Comments are an academic panacea, but everyone who's done any **real** programming knows that comments make the code harder to read, not easier. English is less precise than Java or Visual Basic and makes for a lot of excess verbiage. Programming-language statements are short and to the point. If you can't make the code clear, how can you make the comments clear? Plus, comments get out of date as the code changes. If you believe an out-of-date comment, you're sunk.

The Commento - Steve McConnell

GLAUCON

I agree with that. Heavily commented code is harder to read because it means more to read. I already have to read the code; why should I have to read a lot of comments, too?

ISMENE

Wait a minute...

Ismene puts down her mug of coffee.

ISMENE

I know that commenting can be abused, but good comments are worth their weight in gold. I've had to maintain code that had comments and code that didn't, and I'd rather maintain code with comments. I don't think we should have a standard that says use one comment for every 'x' lines of code, but we should encourage everyone to comment.

SOCRATES

If comments are a waste of time, why does anyone use them, Callicles?

CALLICLES

Either because they're required to or because they read somewhere that they're useful. No one who's thought about it could ever decide they're useful.

SOCRATES

Ismene thinks they're useful. She's been here three years, maintaining your code without comments and other code with comments, and she prefers the code with comments. What do you make of that?

CALLICLES

Comments are useless because they just repeat the code in a more verbose—

THRASYMACHUS

Wait right there! Good comments don't repeat the code or explain it. They clarify its intent. Comments should explain, at a higher level of abstraction than the code, what you're trying to do.

ISMENE

Right. I scan the comments to find the section that does what I need to change or fix. You're right that comments that repeat the code don't help at all because the code says everything already. When I read comments, I want it to be like reading headings in a book or a table of contents. Comments help me find the right section, and then I start reading the code. It's a lot faster to read one sentence in English than it is to parse 20 lines of code in a programming language.

Ismene continues talking as she walks over and pours herself another cup of coffee.

ISMENE

I think that people who refuse to write comments, one, think their code is clearer than it could possibly be, two, think that other programmers are far more interested in their code than they really are, three, think other programmers are smarter than they really are, four, are lazy, or five, are afraid someone else might figure out how their code works.

Ismene continues talking as she walks back to the group.

ISMENE

Code reviews would be a big help here, Socrates. If someone claims they don't need to write comments and are bombarded by questions during a review - when several peers start saying, 'What the heck are you trying to do in this piece of code?' - then they'll start putting in comments. If they don't do it on their own, at least their manager will have the ammo to make them do it. I'm not accusing you of being lazy or afraid that people will figure out your code, Callicles. I've worked on your code and you're one of the best programmers in the company. But have a heart, huh? Your code would be easier for me to work on if you used comments.

CALLICLES

But they're a waste of resources. A good programmer's code should be self-documenting; everything you need to know should be in the code.

THRASYMACHUS

No way! Everything the compiler needs to know is in the code! You might as well argue that everything you need to know is in the binary executable file! If you were smart enough to read it! What is meant to happen is not in the code. Socrates, this is ridiculous. Why do we have to argue about whether comments are valuable? Everything I've ever read says they're valuable and should be used liberally. We're wasting our time.

SOCRATES

Cool down, Thrasymachus. Ask Callicles how long he's been programming.

THRASYMACHUS

How long, Callicles?

CALLICLES

Well, I started on the Acropolis IV about 15 years ago. I guess I've seen about a dozen major systems from the time they were born to the time we gave them a cup of hemlock. And I've worked on major parts of a dozen more. Two of those systems had over half-a-million lines of code, so I know what I'm talking about. Comments are pretty useless.

Socrates looks at Thrasymachus.

SOCRATES

As Callicles says, comments have a lot of legitimate problems, and you won't realize that without more experience. If they're not done right, they're worse than useless.

CALLICLES

Even when they're done right, they're useless. Comments are less precise than a programming language. I'd rather not have them at all.

SOCRATES

Wait a minute. Ismene agrees that comments are less precise. Her point is that comments give you a higher level of abstraction, and we all know that levels of abstraction are one of a programmer's most powerful tools.

GLAUCON

I don't agree with that. Instead of focusing on commenting, you should focus on making code more readable. Refactoring eliminates most of my comments. Once I've refactored, my code might have 20 or 30 routine calls without needing any comments. A good programmer can read the intent from the code itself, and what good does it do to read about somebody's intent when you know the code has an error?

Glaucon looks pleased with his contribution.

Callicles nods in agreement.

ISMENE

It sounds like you guys have never had to modify someone else's code.

Callicles suddenly seems very interested in the pencil marks on the ceiling tiles.

ISMENE

Why don't you try reading your own code six months or a year after you write it? You can improve your code-reading ability *and* your commenting. You don't have to choose one or the other. If you're reading a novel, you might not want section headings. But if you're reading a technical book, you'd like to be able to find what you're looking for quickly. I shouldn't have to switch into ultra-concentration mode and read hundreds of lines of code just to find the two lines I want to change.

GLAUCON

All right, I can see that it would be handy to be able to scan code. But what about Callicles' other point, that comments get out of date as the code changes? I've only been programming for a couple of years, but even I know that nobody updates their comments.

ISMENE

Well, yes and no. If you take the comment as sacred and the code as suspicious, you're in deep trouble. Actually, finding a disagreement between the comment and the code tends to mean both are wrong. The fact that some comments are bad doesn't mean that commenting is bad.

Ismene downs the rest of her coffee.

ISMENE

I'm going to go get another pot of coffee.

Ismene leaves the room.

The Commento - Steve McConnell

CALLICLES

My main objection to comments is that they're a waste of resources.

SOCRATES

Can anyone think of ways to minimize the time it takes to write the comments?

GLAUCON

Design routines in pseudocode, and then convert the pseudocode to comments and fill in the code between them.

CALLICLES

OK, that would work as long as the comments don't repeat the code.

Ismene returns with a pot of coffee.

ISMENE

Writing a comment makes you think harder about what your code is doing. If it's hard to comment, either it's bad code or you don't understand it well enough. Either way, you need to spend more time on the code, so the time you spent commenting wasn't wasted because it pointed you to required work.

SOCRATES

All right. I can't think of any more questions, and I think Ismene got the best of you guys today. We'll encourage commenting, but we won't be naive about it. We'll have code reviews so that everyone will get a good sense of the kind of comments that actually help. If you have trouble understanding someone else's code, let them know how they can improve it.

END.